PART 665—BUS TESTING

Subpart A—General

Subpart B—Bus Testing Procedures

Subpart C—Operations

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Subpart A—General

§ 665.1 Purpose.

An applicant for Federal financial assistance under the Federal Transit Act for the purchase or lease of buses with funds obligated by the FTA shall certify to the FTA that any new bus model acquired with such assistance has been tested in accordance with this part. This part contains the information necessary for a recipient to ensure compliance with this provision.

§ 665.3 Scope.

This part shall apply to an entity receiving Federal financial assistance under 49 U.S.C. Chapter 53.

§ 665.5 Definitions.

As used in this part—

Administrator means the Administrator of the Federal Transit Administration or the Administrator's designee.

Automotive means that the bus is not continuously dependent on external power or guidance for normal operation. Intermittent use of external power or guidance shall not automatically relieve a bus of its automotive character or requirement for bus testing.

Bus means a rubber-tired automotive vehicle used for the provision of public transportation service by or for a recipient.

Bus model means a bus design or variation of a bus design usually designated by the manufacturer by a specific name and/or model number.

Bus testing facility means the bus testing facility established by the Secretary of Transportation, and includes test track facilities operated in connection with the facility.

Bus testing report, also *full bus testing report*, means a complete test report for a bus model, documenting the results of performing the complete set of bus tests on that bus model.

Curb weight means the weight of the empty, ready-to-operate bus plus driver and fuel.

Emissions means the components of the engine tailpipe exhaust that are regulated by the United States Environmental Protection Agency (EPA), plus carbon dioxide (CO_2) and methane (CH_4).

Emissions control system means the components on a bus whose primary purpose is to minimize regulated emissions before they reach the tailpipe exit. This definition does not include components that contribute to low emissions as a side effect of the manner in which they perform their primary function (*e.g.*, fuel injectors or combustion chambers).

Final acceptance means that a recipient has released the FTA-provided funds to a bus manufacturer or dealer in connection with bus procurement.

Gross weight, also *gross vehicle weight*, means the curb weight of the bus plus passengers simulated by adding 150 pounds of ballast to each seating position and 150 pounds for each standing position (assumed to be each 1.5 square feet of free floor space).

Hybrid means a propulsion system that combines two power sources, at least one of which is capable of capturing, storing, and re-using energy.

Major change in chassis design means, for vehicles manufactured on a third-party chassis, a change in frame structure, material or configuration, or a change in chassis suspension type.

Major change in components means:

(1) For those vehicles that are not manufactured on a third-party chassis, a change in a vehicle's engine, axle, transmission, suspension, or steering components;

(2) For those that are manufactured on a third-party chassis, a change in the vehicle's chassis from one major design to another.

Major change in configuration means a change that is expected to have a significant impact on vehicle handling and stability or structural integrity.

Modified third-party chassis or van means a vehicle that is manufactured from an incomplete, partially assembled third-party chassis or van as provided by an OEM to a small bus manufacturer. This includes vehicles whose chassis structure has been modified to include: a tandem or tag axle; a drop or lowered floor; changes to the GVWR from the OEM rating; or other modifications that are not made in strict conformance with the OEM's modifications guidelines.

New bus model means a bus model that—

(1) Has not been used in public transportation service in the United States before October 1, 1988; or

(2) Has been used in such service but which after September 30, 1988, is being produced with a major change in configuration or a major change in components.

Operator means the operator of the bus testing facility.

Original equipment manufacturer (OEM) means the original manufacturer of a chassis or van supplied as a complete or incomplete vehicle to a bus manufacturer.

Parking brake means a system that prevents the bus from moving when parked by preventing the wheels from rotating.

Partial testing means the performance of only that subset of the complete set of bus tests in which significantly different data would reasonably be expected compared to the data obtained in previous full testing of the baseline bus model at the bus testing facility.

Partial testing report, also *partial test report*, means a report documenting, for a previously-tested bus model that is produced with major changes, the results of performing only that subset of the complete set of bus tests in which significantly different data would reasonably be expected as a result of the changes made to the bus from the configuration documented in the original full bus testing report. A partial testing report is not valid unless accompanied by the full bus testing report for the corresponding baseline bus configuration.

Public transportation service means the operation of a vehicle that provides general or special service to the public on a regular and continuing basis.

Recipient means an entity that receives funds under 49 U.S.C. Chapter 53, either directly from FTA or through a State administering agency.

Regenerative braking system means a system that decelerates a bus by recovering its kinetic energy for on-board storage and subsequent use.

Retarder means a system other than the service brakes that slows a bus by dissipating kinetic energy.

Seated load weight means the weight of the bus plus driver, fuel, and seated passengers simulated by adding 150 pounds of ballast to each seating position.

Service brake(s) means the primary system used by the driver during normal operation to reduce the speed of a moving bus and to allow the driver to bring the bus to a controlled stop and hold it there. Service brakes may be supplemented by retarders or by regenerative braking systems.

Small bus manufacturer means a secondary market assembler that acquires a chassis or van from an original equipment manufacturer for subsequent modification or assembly and sale as 5-year/150,000-mile or 4-year/100,000-mile minimum service life vehicle.

Tailpipe emissions means the exhaust constituents actually emitted to the atmosphere at the exit of the vehicle tailpipe or corresponding system.

Third party chassis means a commercially available chassis whose design, manufacturing, and quality control are performed by an entity independent of the bus manufacturer.

Unmodified mass-produced van means a van that is mass-produced, complete and fully assembled as provided by an OEM. This shall include vans with raised roofs, and/or wheelchair lifts, or

ramps that are installed by the OEM, or by a party other than the OEM provided that the installation of these components is completed in strict conformance with the OEM modification guidelines.

Unmodified third-party chassis means a third-party chassis that either has not been modified, or has been modified in strict conformance with the OEM's modification guidelines.

§ 665.7 Grantee certification of compliance.

(a) In each application to FTA for the purchase or lease of any new bus model, or any bus model with a major change in configuration or components to be acquired or leased with funds obligated by the FTA, the recipient shall certify that the bus was tested at the bus testing facility. The recipient shall receive the appropriate full bus testing report and any applicable partial testing report(s) before final acceptance of the first vehicle by the recipient.

(b) In dealing with a bus manufacturer or dealer, the recipient shall be responsible for determining whether a vehicle to be acquired requires full testing or partial testing or has already satisfied the requirements of this part.

Subpart B—Bus Testing Procedures

§ 665.11 Testing requirements.

(a) A new bus model to be tested at the bus testing facility shall—

(1) Be a single model;

(2) Meet all applicable Federal Motor Vehicle Safety Standards, as defined by the National Highway Traffic Safety Administration in Part 571 of this title; and

(3) Be substantially fabricated and assembled using the techniques, tooling, and materials that will be used in production of subsequent buses of that model.

(b) If the new bus model has not previously been tested at the bus testing facility, then the new bus model shall undergo the full tests requirements for Maintainability, Reliability, Safety, Performance including braking performance, Structural Integrity, Fuel Economy, Noise, and Emissions;

(c) If the new bus model has not previously been tested at the bus testing facility and is being produced on a third-party chassis that has been previously tested on another bus model at the bus testing facility, then the new bus model may undergo partial testing requirements;

(d) If the new bus model has previously been tested at the bus testing facility, but is subsequently manufactured with a major change in chassis or components, then the new bus model may undergo partial testing.

(e) The following vehicle types shall be tested:

(1) Large-size, heavy-duty transit buses (approximately 35″–40″ in length, as well as articulated buses) with a minimum service life of 12 years or 500,000 miles;

(2) Medium-size, heavy-duty transit buses (approximately 30″ in length) with a minimum service life of ten years or 350,000 miles;

(3) Medium-size, medium duty transit buses (approximately 30″ in length) with a minimum service life of seven years or 200,000 miles;

(4) Medium-size, light duty transit buses (approximately 25″–35″ in length) with a minimum service life of five years or 150,000 miles; and

(5) Other light duty vehicles such as small buses and regular and specialized vans with a minimum service life of four years or 100,000 miles.

(f) Tests performed in a higher service life category (*i.e.*, longer service life) need not be repeated when the same bus model is used in lesser service life applications.

(g) The operator of the bus testing facility shall develop a test plan for the testing of vehicles at the facility. The test plan shall follow the guidelines set forth in the appendix to this part.

§ 665.13 Test report and manufacturer certification.

(a) Upon completion of testing, the operator of the facility shall provide the resulting test report to the entity that submitted the bus for testing.

(b)(1) A manufacturer or dealer of a new bus model or a bus produced with a major change in component or configuration shall provide a copy of the corresponding full bus testing report

and any applicable partial testing report(s) to a recipient during the point in the procurement process specified by the recipient, but in all cases before final acceptance of the first bus by the recipient.

(2) A manufacturer who releases a report under paragraph (b)(1) of this section also shall provide notice to the operator of the facility that the report is available to the public.

(c) If a bus model subject to a bus testing report has a change that is not a major change under this Part, the manufacturer or dealer shall advise the recipient during the procurement process and shall include a description of the change and the manufacturer's basis for concluding that it is not a major change.

(d) A bus testing report shall be available publicly once the bus manufacturer makes it available during a recipient's procurement process. The operator of the facility shall have copies of all the publicly available reports available for distribution.

(e) The bus testing report is the only information or documentation that shall be made publicly available in connection with any bus model tested at the bus testing facility.

Subpart C—Operations

§ 665.21 Scheduling.

(a) To schedule a bus for testing, a manufacturer shall contact the operator of FTA's bus testing program. Contact information and procedures are available on the operator's bus testing Web site, *http://www.altoonabustest.com.*

(b) Upon contacting the operator, the operator shall provide the manufacturer with the following:

(1) A draft contract for the testing;

(2) A fee schedule; and

(3) The draft test procedures that will be conducted on the vehicle.

(c) The operator shall provide final test procedures to be conducted on the vehicle at the time of contract execution.

(d) The operator shall process vehicles for testing in the order in which the contracts are signed.

§ 665.23 Fees.

(a) The operator shall charge fees in accordance with a schedule approved by FTA, which shall include prorated fees for partial testing.

(b) Fees shall be prorated for a vehicle withdrawn from the bus testing facility before the completion of testing.

§ 665.25 Transportation of vehicle.

A manufacturer shall be responsible for transporting its vehicle to and from the bus testing facility at the beginning and completion of the testing at the manufacturer's own risk and expense.

§ 665.27 Procedures during testing.

(a) The operator shall perform all maintenance and repairs on the test vehicle, consistent with the manufacturer's specifications, unless the operator determines that the nature of the maintenance or repair is best performed by the manufacturer under the operator's supervision.

(b) The manufacturer shall be permitted to observe all tests. The manufacturer shall not provide maintenance or service unless requested to do so by the operator.

Appendix A to Part 665—Tests To Be Performed at the Bus Testing Facility

The eight tests to be performed on each vehicle are required by SAFETEA–LU and are based in part on tests described in the FTA report ''First Article Transit Bus Test Plan,'' which is mentioned in the legislative history of section 317 of STURAA. When appropriate, Society of Automotive Engineers (SAE) test procedures and other procedures accepted by the transit industry will be used. The eight tests are described in general terms in the following paragraphs.

1. Maintainability

The maintainability test should include bus servicing, preventive maintenance, inspection, and repair. It also should include the removal and reinstallation of the engine and drive train components that would be expected to require replacement during the bus's normal life cycle. Much of the maintainability data should be obtained during the bus durability test at the test track. Up to twenty-five percent of the bus life should be simulated and servicing, preventive maintenance, and repair actions should be recorded and reported. These actions should be

performed by test facility staff, although manufacturers should be allowed to maintain a representative on site during the testing. Test facility staff may require a manufacturer to provide vehicle servicing or repair, under the supervision of the facility staff. Because the operator will not become familiar with the detailed design of all new bus models that are tested, tests to determine the time and skill required to remove and reinstall an engine, a transmission, or other major propulsion system components may require advice from the bus manufacturer. All routine and corrective maintenance should be carried out by the test operator in accordance with the manufacturer's specifications.

The maintainability test report should include the frequency, personnel hours, and replacement parts or supplies required for each action during the test. The accessibility of selected components and other observations that could be important to a bus user should be included in the report.

2. RELIABILITY

Reliability should not be a separate test, but should be addressed by recording all bus failures and breakdowns during testing. It is recognized that with one test bus it is not feasible to conduct statistical reliability tests. The detected bus failures, repair time, and the actions required to return the bus to operation should be recorded in the report.

3. SAFETY

The safety test should consist of a handling and stability test. The handling and stability test should be an obstacle avoidance or double-lane change test performed at the test track. Bus speed should be held constant throughout a given test run. Individual test runs should be made at increasing speeds up to a specified maximum or until the bus can no longer be operated safely over the course, whichever speed is lower. Both left- and right-hand lane changes should be tested.

4. PERFORMANCE

The performance test should be performed on the test track and should measure acceleration, maximum speed attained, gradeability, and braking. The bus should be accelerated at full throttle from a full stop to maximum safe speed on the track. The gradeability capabilities should be measured when starting from a full stop on a steep grade, and supplemented by calculating gradeability based on the acceleration data. The functionality and performance of the service, regenerative (if applicable), and parking brake systems should be evaluated at the test track. The test bus should be subjected to a series of brake stops from specified speeds on high, low, and split-friction surfaces. The parking brake should be evaluated with the bus parked facing both up and down a steep grade.

5. STRUCTURAL INTEGRITY

Two complementary structural integrity tests should be performed. Structural strength and distortion tests should be performed at the Bus Testing Center, and the structural durability test should be performed at the test track.

a. Structural Strength and Distortion Tests

(1) A shakedown of the bus structure should be conducted by loading and unloading the bus with a distributed load equal to 2.5 times the load applied for the gross weight portions of testing. The bus should then be unloaded and inspected for any permanent deformation on the floor or coach structure. This test should be repeated a second time, and should be repeated up to one more time if the permanent deflections vary significantly between the first and second tests.

(2) The bus should be loaded to gross vehicle weight, with one wheel on top of a curb and then in a pothole. This test should be repeated for all four wheels. The test verifies: normal operation of the steering mechanism; and operability of all passenger doors, passenger escape mechanisms, windows, and service doors. A water leak test should be conducted in each suspension travel condition.

(3) Using a load-equalizing towing sling, a static tension load equal to 1.2 times the curb weight should be applied to the bus towing fixtures (front and rear). The load should be removed and the two eyes and adjoining structure inspected for damages or permanent deformations.

(4) The bus should be towed at curb weight with a heavy wrecker truck for several miles and then inspected for structural damage or permanent deformation.

(5) With the bus at curb weight probable damages and clearance issues due to tire deflating and jacking should be assessed.

(6) With the bus at curb weight possible damages or deformation associated with lifting the bus on a two post hoist system or supporting it on jack stands should be assessed.

b. Structural Durability

The structural durability test should be performed on the durability course at the test track, simulating twenty-five percent of the vehicle's normal service life. The bus structure should be inspected regularly during the test, and the mileage and identification of any structural anomalies and failures should be reported in the reliability test.

6. FUEL ECONOMY

The fuel economy test should be conducted using duty cycles that simulate transit service. This test should measure the fuel economy of the bus in miles per gallon or other energy-equivalent units.

The fuel economy test should be designed only to enable FTA recipients to compare the relative fuel economy of buses operating at a consistent loading condition on the same set of typical transit driving cycles. The results of this test are not directly comparable to fuel economy estimates by other agencies, such as the U.S. Environmental Protection Agency (EPA) or for other purposes.

7. NOISE

The noise test should measure interior noise and vibration while the bus is idling (or in a comparable operating mode) and driving, and also should measure the transmission of exterior noise to the interior while the bus is not running. The exterior noise should be measured as the bus is operated past a stationary measurement instrument.

8. EMISSIONS

The emissions test should measure tailpipe emissions of those exhaust constituents regulated by the United States Environmental Protection Agency (EPA) for transit bus emissions, plus carbon dioxide (CO_2) and methane (CH_4), as the bus is operated over specified driving cycles. The emissions test should be conducted using an emissions testing laboratory equipped with a chassis dynamometer capable of both absorbing and applying power.

The emissions test is not a certification test, and is designed only to enable FTA recipients to compare the relative emissions of buses operating on the same set of typical transit driving cycles. The results of this test are not directly comparable to emissions measurements obtained by other agencies, such as the EPA, which are used for other purposes.

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